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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/300,494	04/28/1999	ARTHUR ROBERT CALDERBANK	CALDERBANK-1	4523

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EXAMINER

FAN, CHIEH M

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 03/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/300,494

Applicant(s)

CALDERBANK ET AL.

Examiner

Chieh M Fan

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-8 and 11-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-8, 15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The amended specification in the paragraph beginning at line 19 of page 5 and beginning at line 8 of page 14 are objected. The mathematical expression $R_1 < R_2 < L < R_L$ is not understood. In particular, L is the number of parallel data streams and R_i ($i=1, 2, L$) is the coding rate. It is not clear how to compare two different things (i.e., L and R_i). Further, the mathematical expression does not mention the rates R_3 through R_{L-1} . What is the relationship among these rates?

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The mathematical expression $R_1 < R_2 < L < R_L$ is not understood. In particular, L is the number of parallel data streams and R_i ($i=1, 2, L$) is the coding rate. It is not clear how to compare two different things (i.e., L and R_i). Further, the mathematical

Art Unit: 2634

expression does not mention the rates R_3 through R_{L-1} . What is the relationship among these rates?

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 5, 6, and 17-19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Since the applicants have amended the specification, the claimed limitations in claims 5, 6, 17 and 18 do not have support in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. Claims 3, 4 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Calderbank et al. (US Patent 6,127,971).

Regarding claim 3, Calderbank et al. (different inventive entity) teach a transmitter comprising:

A demultiplexer (100 in fig. 1) responsive to an input signal for developing a plurality of at least two signal streams, and

A like plurality of channel coding/space-time coding transmitters (see 110, 110-1, 110-2, 120, 120-1, 102-2, 130, 130-1, and 130-2 in Fig. 1), each responsive to a different signal stream of said plurality of signal streams.

Regarding claim 4, Calderbank et al. teach that encoder 110 encodes the signal in according to a trellis code C1 and develops 2 symbols; encoder 120 encodes the signal in according to a trellis code C2 and develops 3 symbols; and encoder 130 encodes the signal in according to a trellis code C3 and develops 1 symbols (see col. 7, line 61-col. 8, line 3, and see col. 8, lines 20-24). Therefore, each of the encoders 110-130 includes a channel encoder and a space-time encoder. Further, Calderbank et al. teach each stream of data is input to a pulse shaper and a modulator before transmitted (see col. 3, lines 39-41). Therefore, each of the transmitters 110-1, 110-2, 120-1, 120-2, 130-1 and 130-2 implicitly includes a pulse shaper and a modulator.

Regarding claim 7, the channel encoder is a trellis encoder (see col. 8, lines 23-24).

8. Claims 3 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kotzin et al. (US Patent 6,173,005).

Regarding claim 3, Kotzin et al. teach a transmitter comprising:

Art Unit: 2634

A demultiplexer (803 in fig. 8) responsive to an input signal for developing a plurality of at least two signal streams, and

A like plurality of channel coding/space-time coding transmitters (see 304, 806, 808 in Fig. 8, also see col. 14, line 3), each responsive to a different signal stream of said plurality of signal streams.

Regarding claim 8, encoder 304 may be a convolutional encoder (see col. 5, lines 30-35).

9. Claims 15 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Raleigh et al. (US Patent 6,144,711).

Regarding claim 15, Raleigh et al. discloses a space-time signal communication system (see abstract). The input signal is demultiplexed into a plurality of data streams (see "DATA" in Fig. 21). Each of the plurality of data streams is input to a respective channel coding encoder (see 10 in Fig. 21, also see col. 5, lines 40-41 and 52-60). The output of the channel coding encoder is respectively sent a space-time coding transmitter (see TSW's 210a-210f in Fig. 21, note that each of the TSW's is connected to a transmitter SOP (see 190 in Fig. 11 or 13), a modulation and RF system (see 40 in Fig. 11 or 13) and a transmit antenna (see 51 in Fig. 11 or 13)).

Regarding claim 20, the channel encoder performs trellis or convolutional encoding (see col. 5, line 56-57).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calderbank et al. as applied to claims 3, 4 and 7 above.

Calderbank et al. do not teach that the channel encoder performs convolutional encoding. However, both trellis coding and convolutional coding are well-known channel encoding schemes in the art (official notice is taken here). The use of a trellis encoding or a convolutional encoding is merely a design choice, since either coding scheme would achieve the purpose of channel coding.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kotzin et al. as applied to claims 3 and 8 above.

Kotzin et al. do not teach that the channel encoder performs trellis encoding. However, both trellis coding and convolutional coding are well-known channel encoding schemes in the art (official notice is taken here). The use of a trellis encoding or a convolutional encoding is merely a design choice, since either coding scheme would achieve the purpose of channel coding.

Response to Arguments

13. Applicant's arguments filed 12/17/01 have been fully considered but they are not persuasive.

The applicants argue that the transmitter in the cited prior art is not an arrangement according to the disclosed specification (i.e., the arrangement comprises a channel coding element, following by a space-time coding element, and followed still by some other means).

Examiner's response --- In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a channel coding element, following by a space-time coding element) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Allowable Subject Matter

14. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers

Art Unit: 2634

for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Chieh M Fan *CF*
Examiner
Art Unit 2634

cmf
February 26, 2002


STEPHEN CHIN
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